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PROGRAM NAME : Domestic Product Development – Marketplace Driven
PROGRAM COORD. : J. N. Smith
WRITTEN BY : J. L. Spruill
PERIOD COVERED : Second Quarter, 1993

Coordinator Summary: Domestic Product Development programs are in line with commitments forecasted. Timelines and schedules are in place for the projected launch of Marlboro RX in October. The Merit 3mg (NET) cigarette consumer testing is complete. Ultima Menthol consumer testing is complete with data being evaluated to confirm program objectives. The menthol objectives, for the Virginia Slims King Size program, has been redirected to the development of a full flavor cigarette. Lights non–menthol cigarettes are available for quantitative testing, utilizing the booklet and rounded corner packaging. Parliament Lights Menthol and Marlboro Ultra Lights factory trials have been completed. Basic full flavor menthol cigarette specifications have been issued. The low sidestream/low odor program will focus its technology benefit application to the Merit brand family.

I. **Objective: Benson & Hedges King Size Line Extensions** Design and develop a Benson & Hedges King Size Menthol and Regular, Full Flavor and Lights.

A. **Strategy:** Launch.

1. **Results:** The Benson & Hedges King Size family production at Stockton Street continues to be analytically and subjectively monitored. The full flavor menthol product produced in July and August, 1992, was recalled because of subjective unacceptability. To assure and maintain the subjective quality of the product line, a procedure is being developed using data from solvent testing on packaging, residual ethanol testing on packaged cigarettes and analytical testing for propionic, acetic, and butyric acids on filler. Data collection is in progress.

2. **Plans:** Implement continuous procedure to maintain subjective quality of the product line.

II. **Objective: Benson & Hedges Ultra Lights King Size** Design and develop 6mg tar line extensions in regular and menthol versions. Based on predicted liking ratings for cork tipping, cigarettes should reflect a 0.7 tpp and an associated mpp of 0.05 – 0.06. Menthol per puff ranges and predicted liking ratings were reviewed for Salem Ultra Lights, Merit Ultra Lights, True, Salem Lights, Newport Lights and Kool Lights. Cigarettes should maintain Benson & Hedges character.

A. **Strategy:** Cigarette Development.

1. **Results:** A second generation of regular and menthol prototypes were completed. Regular models used blends T–518 (MFUL using NET) and T–520 (DUL using NET), flavored and unflavored. Menthol models used the MB4B blend, flavored and unflavored. Subjective evaluations are in progress.

2. **Plans:** Complete regular and menthol prototype development. Prepare for regular and menthol cigarette research scheduled in September.

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III. Objective: Parliament Lights Menthol Develop Parliament Lights Menthol LS FTB and 100's SP cigarettes for Region I. Position cigarette at appropriate tar and menthol per puff to be competitive with Newport Lights, a major competitor in Region I.

A. **Strategy:** Modify current design and develop prototypes for 11mg and 13mg tar cigarettes acceptable to full flavor menthol smokers.

1. **Results:** Factory trials for the 11mg and 13mg tar cigarettes were completed at Stockton Street on April 22.

2. **Plans:** Complete 11mg and 13mg cigarette specifications.

IV. Objective: Marlboro Ultra Lights Develop 6mg tar line extensions in KS and 100mm providing enhanced subjective quality and Marlboro character. Incorporate 10–078–A cigarette paper for optimum puff count control.

A. **Strategy:** Factory trial/POL Testing.

1. **Results:** Based on the results of a cigarette paper study incorporating 10–078–A paper, a POL test has been requested, in conjunction with a factory trial, to use the 10–078–A cigarette paper on both the KS and 100mm cigarettes. The factory trial will be completed the week of May 24th in Cabarrus.

2. **Plans:** Dependent upon analytical and subjective confirmation, revise cigarette specifications to reflect cigarette paper modification.

V. Objective: Marlboro RX Develop 72mm full flavor and lights cigarettes at equal tar per puff to KS/LS counterparts.

A. **Strategy:** Machinery Development

1. **Results:** Revised timelines are being completed for the SP and FTB machinery installations in Louisville. Product support continues for packer qualification at York Engineering and GD.

2. **Plans:** Continue to provide support to Engineering.

B. **Strategy:** Factory Trials

1. **Results:** Factory trials have been completed on production makers in Louisville for the full flavor and lights cigarettes. Preliminary cigarette specifications have been completed and issued for the full flavor SP and FTB cigarettes.

2. **Plans:** Dependent upon analytical and subjective confirmation, preliminary cigarettes specifications for the lights SP and FTB will be issued.

C. **Strategy:** Production Start–up

1. **Results:** The first SP comflex is scheduled to be production ready by May 18, 1993, with machinery set–up to be performed using dye–line packaging material. The first FTB comflex is scheduled to be production ready by June 16, 1993.

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2. **Plans:** Provide support to all departments for production start–up.

VI. **Objective: Merit Ultima Menthol** Develop Menthol KS/100mm line extensions for lowest levels of tar (Merit Ultima) sensorially better than Carlton and Now Menthol among higher tar smokers.

A. **Strategy:** Cigarette Development

1. **Results:** Three replicate POL tests each of king size and 100mm menthol cigarettes have been completed. Consumer research data is being reviewed for substantiating the project objectives.

2. **Plans:** Complete the evaluations of the consumer research data. Write preliminary specifications for the king size and 100mm menthol cigarettes.

VII. **Objective: Merit 3mg** Develop a 3mg tar Merit cigarette which achieves parity in strength and liking to leading ultra lights cigarettes (MUL, VUL, WUL) when tested among ultra low and flavor low smokers.

A. **Strategy:** NET Inclusion

1. **Results:** Replicate POL testing of the NET 3mg cigarette has been completed. The objective of the NET incorporation portion of the program was met. No additional consumer research is planned for the NET 3mg cigarette.

2. **Plans:** Upon availability of the NET processing specification, complete the 3mg preliminary cigarette specifications.

B. **Strategy:** DIET Prototype Development

1. **Results:** DIET prototypes using blends #298 (38% JET) and MFUL (20% BLDET) were completed and subjectively evaluated. Flavor applications and types were modified to provide mainstream response and Merit character. The MFUL blend was selected, utilizing the Merit Ultima Bright casing, as the most appropriate candidate.

2. **Plans:** Replicate consumer testing is scheduled for August and September.

VIII. **Objective: Merit 6mg** Develop a 6mg tar cigarette with the sensory attributes of an 8–9mg tar cigarette.

A. **Strategy:** NET Inclusion

1. **Results:** Prototype development utilizing NET is complete. Replicate POL testing is scheduled for June and August using blend #436 (25% NET). Make Pack has been completed for the first replicate POL test.

2. **Plans:** Complete analytical and subjective evaluations for the first replicate POL test.

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IX. Objective: Virginia Slims King Size Develop lights and full flavor regular and menthol king size line extensions utilizing 24.0mm circumference and 83mm length.

A. Strategy: Cigarette Development

1. **Results:** Replicate POL testing for the lights and medium regular cigarettes has been completed. The objective of the program has been redirected to focus on a menthol full flavor cigarette to appeal to Newport smokers, as well as, develop a full flavor regular cigarette. Tar per puff and menthol per puff parameters are being decided.

2. **Plans:** Establish cigarette parameters, fabricate prototypes and schedule full flavor and lights menthol testing in late third quarter, early fourth quarter.

B. Strategy: Packaging Development

1. **Results:** The Booklet Pack (three individual packs held together with a perforated label on the back and overwrapped as a single pack of 20's) has been designated as the first choice packaging candidate for the line extension. A quantitative test is scheduled for June 15 to determine the marketing potential for the booklet pack. No additional machinery will be purchased until the results of the quantitative test are in. Development will continue on the seven's packer so that product evaluation can be completed. A machine will be installed in Semiworks in June. Maker/Tipper parts are being delivered with all kits in stock at York Engineering.

   Virginia Slims lights king size cigarettes were completed, in Semiworks, for the quantitative testing. These cigarettes will be used for presentation in the booklet and rounded corner packages. The white rounded corner blanks required have been received. An approved clear binding tape for use on the booklet pack is in–house.

   To address pack moisture issues for the booklet pack, cigarettes were packed in 7's packs at Molins and in rounded corner packs at Stockton Street. These packaged cigarettes will be used for baseline pack moisture studies.

2. **Plans:** Complete quantitative research packages for testing. Complete baseline pack moisture studies and apply data to the development of the line extension.

X. Objective: Low Sidestream/Low Odor Determine the "sensory cost" vs. "concept benefit" relationship for LSS/LO cigarettes.

A. Strategy: Release Compound Technology Studies

1. **Results:** Samples were completed and submitted for in–house analytical evaluations to address Phase IV clearance for low sidestream cigarette paper coated with CR–2978 (release agent for α–HCA).

   Additionally, CR–2612 (poly isopropenyl acetate), an acetic acid release compound, has been applied to 100mm, 24.0 circumference cigarettes with grade 049 (41gm basis weight) low sidestream cigarette paper. Twenty (20) microliters of a 10% CR–2612 w/w in ethanol solution were applied to the cigarette paper, yielding approximately 4mg of CR–2612 per cigarette.

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Compared to unflavored control cigarettes, the cigarettes treated with CR–2612 were found to be subjectively preferred, imparting more clean/sweet tobacco flavor and less papery/oily coating.

Subsequent to these encouraging results, low sidestream paper grade numbers 044, 049, and 016 were coated in–house by the Paper Technology Group. Papers were coated with a 17% CR–2612 solution w/w in ethanol. Control papers of each paper grade were coated with ethanol. Cigarettes were fabricated in Semiworks in the Marlboro Lights configuration (blend cased with humectants and sugars only, no aftercut).

2. **Plans:** Sidestream reduction analysis and subjective evaluations of these machine–made prototypes have begun. An analytical method to determine the CR–2612 content of coated papers is being evaluated. Further flavor/cigarette development is planned utilizing the Merit Brand family.

B. **Strategy:** LSS Application to Premium Brands

1. **Results:** Samples were completed and submitted for analytical and visibility reduction analysis. Models used three blends (Merit, Merit Ultra Lights, Marlboro Ultra Lights) and three heavy basis weight cigarette papers (016, 044, 049). A corresponding control was completed for each set of models. Based on subjective and analytical evaluations, an additional cigarette paper (43gm/30% $CaCO_3$/12% MKP/5.5Cu) was requested, for additional models to be made, for possible improved analytical and visibility reduction data. Of the twelve original models completed, the Merit Ultra Lights blend using the 044 cigarette paper showed the most promise, analytically and subjectively. This model will be used for further filter and flavor development at the 5mg tar level.

2. **Plans:** Continue flavor and filter development improvements for the Merit Family. Utilize paper development in program progress for visibility reduction and analytical parameters.

XI. Objective: Basic Full Flavor KS/100mm Menthol Develop full flavor king size and 100mm cigarettes competitive with generic menthol competitors.

A. **Strategy:** Cigarette Development

1. **Results:** Models, utilizing Brica IV blend and three aftercut flavors, were completed and compared analytically and subjectively to the current Best Buy full flavor menthol. The decision was made to utilize the Best Buy blend and flavor system for the Basic Full Flavor menthol cigarettes.

2. **Plans:** Complete and issue cigarette specifications for production start–up in June.

XII. Objective: Consumer Testing Generate a database of strength and liking scores for PM and competitor's products to identify new cigarette opportunities and cigarette/process improvements.

A. **Strategy:** Routine Testing of Philip Morris and Competitor's Cigarettes

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1. **Results:**

Number of tests completed	14
Number of tests released	14
Number of tests in progress	6
Number of tests projected for 3rd Quarter	9

2. **Plans:** Initiate and complete projected 3rd quarter testing.

B. **Strategy:** Supply Cigarettes for Non–Standard POL's

1. **Results:**

Number of tests completed	13
Number of tests released	13
Number of tests in progress	7
Number of tests projected for 3rd Quarter	0

2. **Plans:** Initiate and complete 3rd quarter testing.

C. **Strategy:** POL's For New Cigarette Development

1. **Results:**

Number of tests completed	6
Number of tests released	2
Number of tests in progress	2
Number of tests projected for 3rd Quarter	6

2. **Plans:** Initiate and complete 3rd quarter testing.

D. **Strategy:** POL's for Cigarette/Process Improvement Programs

1. **Results:**

Number of tests completed	2
Number of tests released	1
Number of tests in progress	8
Number of tests projected for 3rd Quarter	7

2. **Plans:** Initiate and complete 3rd quarter testing.

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XIII. Objective: De–NIC Develop a family of subjectively acceptable ultra low, low tar and full flavor cigarettes from filler which, through supercritical CO_2 extraction, has a residual nicotine level of <0.1%.

A. Strategy: Subjective Development/Incremental Change

1. **Results:** De–Nic prototypes at 11mg and 16mg tar, varying nicotine–in–smoke levels, were completed achieving the desired tar and nicotine levels. Samples and analytical data were forwarded to Sensory Technology for additional evaluative research.

2. **Plans:** No immediate activity forecasted.

XIV. Objective: Integrated Modeling & Database Management Design and implement an integrated modeling and database management system for Product Development.

A. Strategy: System Design.

1. **Results:** Eight PC's were installed in April by CAD. Due to budgetary constraints, the remaining 19 PC's will not be ordered in 1993. The installed eight will be redistributed within Cigarette Technology. Three of the eight will become shared. A scheme for preserving the PC environment and data by individual has been worked out and prototyped.

   A new version of the cigarette modeling program was released by J. Kao for testing only by D. Newman, W. Claflin and B. Maher.

   The mechanics have been worked out on integrating information from Microsoft Project into Excel, Word and Powerpoint. This was necessary in order to demonstrate that for planning purposes, information will only need to be entered once.

2. **Plans:** Work with CAD to relocate the three PC's. By mid–July, finish testing of the cigarette modeling program and provide feedback to J. Kao.

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PROGRAM NAME : Domestic Product Development – Operations Driven
PROGRAM COORD. : Vivian E. Willis, C. Kroustalis, G. Yatrakis
WRITTEN BY : Vivian E. Willis, C. Kroustalis, G. Yatrakis
PERIOD COVERED : Second Quarter, 1993

MARLBORO

Coordinator Summary: Implementation of BLT (RCBT, RLTCT and RLBT) has been completed. Internal and external testing continues to monitor Marlboro. Blend development and factory trials continue with the 14% BLDET and offshore inclusion. POL testing is scheduled for the offshore inclusion into Marlboro.

I. **Objective:** To monitor the product analytically and subjectively to ensure parity and quality.

A. **Strategy:** Increase the expanded tobacco in full margin brands.

1. **Results:** Blend development for the 14% BLDET for Marlboro continues. One factory trial was conducted with the proposed blend in combination with the offshore burley inclusions. Subjective differences were noted compared to the control.

   A factory trial was conducted the week of May 17 in Cabarrus. POL quantities of the 14% expanded with offshore inclusion was produced for July shipment.

2. **Plans:** Implementation of the 14% BLDET blend is scheduled for November, 1993. Product Development Directorate personnel will continue to assist the Leaf Blending Group with blend development, factory coverage and subjective evaluation of planned increases in expanded tobacco and support implementation as scheduled.

3. **Contributors:** S. Ruziak, K. Deane, B. Woodson, M. White, T. Gannon, D. Atkinson, A. Smith, M. Jeltema, R. Keatts, J. Hutchison, D. Rockwell, Semi–Works, CTSD and ARD.

B. **Strategy:** Evaluate increased inclusion rates for offshore tobaccos in premium brands.

1. **Results:** A factory trial was conducted for the addition of two cases of offshore bright to BLDET at Stockton Street in February. Differences in subjectives were noted. The planned implementation in March was put on hold.

   The second factory trial was conducted in Cabarrus with increased offshore inclusion included in the following test models:

   Test #1: The addition of two cases of offshore Burley added to the Burley components.

   Test #2: The addition of four cases of offshore Burley added to the Burley components.

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Test #3: The addition of four cases of offshore burley added to the Burley components and two cases of offshore Bright plus 9% Oriental to BLDET.

Subjective differences were noted with all three test models compared to the control Marlboro.

A third factory trial was conducted the week of May 17 in Cabarrus. POL quantities of Test #1 (two cases of burley offshore inclusion) and Test #3 (four cases of offshore burley plus increased BLDET to 14%) were produced.

2. **Plans:** Product Development Directorate personnel will continue to assist the Leaf Blending Group with blend development, factory coverage and subjective evaluation of planned increases in offshore inclusion and support implementation as scheduled.

3. **Contributors:** S. Ruziak, K. Deane, B. Woodson, M. White, T. Gannon, D. Rockwell, D. Atkinson, A. Smith, M. Jeltema, R. Keatts, J. Hutchison, Semi–Works, CTSD and ARD.

C. **Strategy:** Monitor POL runs to aid in the identification of sources of variation in the qualification of blend changes to Marlboro.

1. **Results:** POL testing of Marlboro KS and FTB with November, 1992 blend and March, 1993 blend continues. The POL testing includes all factory locations and Semi–Works. All POL's were monitored by members of the Product Development Directorate through processing and cigarette making. To date, twenty–seven POL's have been monitored since January.

2. **Plans:** Continue monitoring the production of Marlboro KS and FTB for all POL testing through 1993.

3. **Contributors:** S. Ruziak, K. Deane, B. Woodson, M. White, T. Gannon, D. Rockwell, D. Atkinson, R. Keatts.

D. **Strategy:** Investigate the new discount pool tobaccos.

1. **Plans:** Assist Leaf Blending with subjectives and analytical data as needed. Support implementation as needed.

2. **Contributors:** S. Ruziak, K. Deane, B. Woodson, D. Atkinson, R. Keatts, J. Hutchison.

PROJECT GRAIN

Coordinator Summary: This program is on schedule. Implementation of Phase I Grain has been completed. Internal and external testing continue to monitor Marlboro with additional alcohol and humectant reductions and the reductions in combination with other proposed changes in Marlboro.

A. **Strategy:** Reduce alcohol in domestic flavor systems in combination with alcohol–free burley top casing.

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1. **Results:** Five domestic aftercut formulas were modified to reduce the added alcohol content by 30% (volume/volume). Reference samples were made for observations and Flavor Center testing.

2. **Plans:** POL 03129 – Marlboro with alcohol–free burley top casing plus 30% alcohol reduced in the aftercut (total of 52%) with February, 1993 blend will be produced for June shipment. Continue modifications of domestic aftercuts to achieve desired alcohol and humectant reduction/rearrangement.

3. **Contributors:** S. Ruziak, B. Woodson, Semi–Works, CTSD and ARD.

B. **Strategy:** Reduce/rearrange PG in flavor system in combination with alcohol–free burley top casing and aftercut reductions.

1. **Results:** Models with 97% alcohol and 25% PG reduction were developed with the February, 1993 blend change and requests were submitted to Semi–Works for prototypes.

2. **Plans:** POL 03133 – Marlboro with alcohol–free burley top casing plus 50% alcohol reduced aftercut plus 25% PG reduction in flavor system (total of 67% alcohol plus 25% PG reduction) will be produced for shipment in July.

   An additional POL is scheduled for August. This POL will contain 97% alcohol and 25% PG reduction with the February, 1993 blend.

3. **Contributors:** S. Ruziak, B. Woodson, M. White, Semi–Works, CTSD and ARD.

C. **Strategy:** Remove 30% of added alcohol from menthol brands in 1994.

1. **Results:** The following menthol aftercuts were reformulated and are being analyzed for QA specifications: B&H 100's Ultra Lights, B&H 100's, Marlboro, Merit and Merit Ultra Lights.

2. **Plans:** Review analytical data, make adjustments where needed, complete remaining menthol aftercut modifications. POL test(s) appropriate prototypes. Make recommendation based on internal subjectives, analytical and POL findings.

3. **Contributors:** H. Maxwell, S. Ruziak, B. Woodson, W. Thomas.

D. **Strategy:** Remove all alcohol from aftercuts in Australian brands to conform with government flash point requirements.

1. **Results:** A second series of trials were conducted in Australia to evaluate the performance of Grain aftercuts. Flavor Technology personnel were on–site to support this effort. Marlboro trials were successful. Acceptable filler for the following was not achieved: Alpine, Breeze and Zephyr.

2. **Plans:** Continue evaluations with Marlboro internally and to conduct consumer testing in Australia.

3. **Contributors:** S. Ruziak, H. Maxwell, B. Woodson, W. Thomas.

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ALTERNATE HUMECTANTS

I. Objective: Produce flavor systems and reconstituted tobacco materials with alternate humectants for cost reduction and defensive purposes.

A. Strategy: Develop and evaluate alternate humectants replacing propylene glycol and glycerin in PM brands.

1. **Results:** A factory trial of RCB with isosweet replacing propylene glycol and glycerin was conducted at the BL Plant in April. Problems were encountered with sheet integrity.

2. **Plans:** Sheet models have been scheduled in "C" Pilot Plant during June to resolve the sheet formation issues before additional BL Plant trials are conducted. Once successful sheet is produced, survivability studies and microbiological evaluations will be conducted. The baseline POL is scheduled for the fourth quarter.

3. **Contributors:** S. Ruziak, J. Swain, B. Hoskin, B. Taylor and D. Chadick.

MARLBORO RI

II. Objective: Develop a Marlboro flavor system containing fewer than 40 listed components which supports the subjective character in Marlboro cigarettes.

A. Strategy: Develop new reduced–ingredient flavor systems and subjectively evaluate blend modifications.

1. **Results:** POL 03107 was completed. POL results indicated similar results to the previous testing.

2. **Plans:** Modifications are being made to the flavor system to comply with Project Grain. Continue development.

3. **Contributors:** B. Taylor, K. Deane, L. Vinson, J. Swain, L. Wilkinson, PED, Semi–Works, CTSD, ARD.

SUBJECTIVE PANELS

III. Objective: To provide subjective evaluation of prototypes, modifications of existing brands, new brands and competitors' products (domestic).

A. Strategy: Conduct evaluation for development programs, monitoring of domestic competitive brands and any problems associated with production and/or processing plants.

1. **Results:** Seventy–eight panels were completed on the Flavor Technology Panel this quarter which included the subjective characterization of ten competitors' brands. Ten panels were conducted on the Cast Leaf Panel. Thirty–five POL's were evaluated before overtipping.

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The following brands were subjectively monitored for start–up at the following locations:

Cabarrus:

Marlboro KS and LS (Full Flavored, Lights)
Marlboro 100 mm SP
Basic 85 mm SP (Full Flavored, Lights and Ultra Lights)
Cambridge 85 and 100 mm (Full Flavored and Lights)
B&H 100 mm SP
Best Buy 100 mm SP
Famous Value Ultra Lights 100 mm SP
Bristol 85 mm SP (Full Flavored and Lights)

The Semi–Works panel continues to evaluate the products from the extended storage study for Merit metallized film (Regular and Menthol) from Ambient, Warehouse and Cold Storage.

The Flavor Technology panel has completed the multi–layer film storage study for the Marlboro KS SP stored under Ambient, Desert and Cold conditions.

2. **Plans:** Continue to provide subjective support for evaluation of development programs, monitoring of domestic competitive brands and any problems associated with production and/or processing plants. Complete extended storage study with alternate films for Merit.

3. **Contributors:** K. Deane, J. Gear, Flavor Technology Domestic Panel, Film Panel and Semi–Works panel.

IV. Objective: To provide training, maintenance and support to auxiliary panels (e.g., Richmond, Semi–Works, Filter and Paper and Cast Leaf Panel).

A. Strategy: Train auxiliary panels to screen development prototypes and to judge acceptability of final products.

1. **Results:** The Semi–Works panel continues to evaluate prototypes with processing parameters for the large and small scale primaries.

2. **Plans:** To continue training in various test methodologies applicable to types of testing required. Coordinate a training schedule for a new Quality Assurance Smoking Panel.

3. **Contributors:** K. Deane, C. Scott, Flavor Technology personnel, Semi–Works, Cast Leaf and Filter and Paper Panel members.

V. Objective: To provide subjective evaluation of development prototypes, modifications of existing brands and export (PM and competitors' brands).

A. Strategy: Continue to monitor existing brands and provide subjective evaluations for prototypes development. Provide further training to standardize panels.

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1. **Results:** Thirteen PM brands from various warehouses have been subjectively evaluated to determine acceptability for shipment.

   The following new brand start–ups were evaluated for shipment:

   Cabarrus:
   PMSL 85 mm FTB

   Manufacturing Center:
   Lark 100 FTB
   Lark Milds 85 mm SP
   L&M 100 mm SP
   Marlboro 85 mm FTB

   Stockton Street:
   Next 10's
   Parliament 100 mm FTB
   Marlboro GCC 85 mm FTB

2. **Plans:** To continue to provide subjective support as needed.

3. **Contributors:** K. Deane and International Panel.

MARLBORO STANDARDIZATION

VI. Objective: To identify and reduce the source of variation in PM brands between production and processing facilities.

A. **Strategy:** Conduct factory pickups and a standard run to monitor the quality of Marlboro by subjective and analytical testing.

1. **Results:** The final report for the December 17, 1992 factory pickup has been issued on subjective and analytical results. The Marlboro Standardization panel evaluated the products produced in the February factory trial (11/92 blend vs. the 3/93). The final report has been issued on subjectives and analytical. The factory panels evaluated both the December 17 factory pickup and the factory trial models. A mini–standard run was conducted in March at the Manufacturing Center and Semi–Works (large and small scale) primaries.

2. **Plans:** Results will be issued on the mini–standard run by the end of May. A factory pickup will be conducted in June on Marlboro and Marlboro Mediums.

3. **Contributors:** K. Deane, Marlboro Standardization Panel and the Factory Panels.

VII. Objective: Provide training, maintenance and support to factory panels which could possibly identify and reduce sources of taste/odor/stale customer complaints.

A. **Strategy:** Conduct training for factory panels and quarterly panel leader workshops. The factory panels will monitor their daily production which could identify and possibly reduce taste/odor/stale customer complaints. Factory panels will also evaluate factory pickups and Standard Runs for monitoring purposes.

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1. **Results:** The Cabarrus factory panels completed training in twenty–six attributes, five blend components and three blends.

   The Louisville Regular panels completed training in the following areas: basic taste, impact/response and three attributes.

   The Manufacturing Center panels completed basic taste screening, twelve attributes and one blend component.

2. **Plans:** To continue training when time permits.

3. **Contributors:** K. Deane and Factory Panels.

VIII. Objective: Subjectively test externally (POL testing) Marlboro products from the different locations to aid in defining/confirming Marlboro control regions and developing new statistical methods.

A. Strategy: POL testing of scheduled factory pickups and cigarettes produced from Standard Run XI. This will aid in defining Marlboro control regions and develop new statistical methods.

1. **Results:** Eleven monitored POL tests of Marlboro KS and FTB with the 11/92 blend have closed. More monitored controls (11/92 blend) are in the field. The first series of 11/92 controls have been reviewed by the Marlboro team.

2. **Plans:** Five POL's incorporating the February blend change are scheduled for May and June. These POL's are in conjunction with the overtipping single pack research study.

3. **Contributors:** A. Smith, M. Jeltema, D. Atkinson, S. Ruziak, B. Woodson, K. Deane, M. White, ARD, Semi–Works and factories.

PROCESSING PLANT SUPPORT

IX. Objective: To provide support to Park 500 for flavor systems and process modifications to address economic, environmental and overall quality issues.

A. Strategy: Evaluate process modifications.

1. **Results:** Park 500 trials were made of RLB on Line 3 with recycled size levels similar to levels experienced on Lines 1 and 2. Analyses were compared for solubles and final sheet samples between Line 3 (Weigand FFE) and Line 2 (Wiped Film Evaporator). Although solubles showed slightly lower volatile acid levels on the Line 3 test, final RLB sheet samples were comparable in analyses.

   Subjective comparisons were made by internal panels of the intermediate and final recycled RLB sheets in Semi–Works Marlboro cigarettes. Further Park 500 trials were recommended due to subjective differences.

2. **Plans:** Support further trials at Park 500 as needed including analytical and subjective testing of centrifuge sludge reclaim.

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3. **Contributors:** J. Pflueger, J. Swain, L. Vinson, ARD, CTSD and Semi–Works.

X. Objective: To support production and utilization of RCBT (liquid flavor, unwashed burley stem and reduced humectants) from the BL Plant.

A. **Strategy:** Continue subjective support for production of RCBT at the BL Plant.

1. **Results:** Subjective evaluations of RCBT were made testing alternate "C" dryer lubricants as well as product on hold due to processing concerns. Results and recommendations were made to BL Plant personnel.

2. **Plans:** Continue to support RCBT production as needed.

3. **Contributors:** B. Hoskin, S. Ruziak, M. Parker, L. Vinson, J. Swain, ARD, CTSD and Semi–Works.

XI. Objective: To evaluate feedstock blending and substitutions to address issues of consistency and cost effectiveness.

A. **Strategy:** To evaluate variations in feedstock blending and stemmery reclaim dust production.

1. **Results:** BL Plant trials were completed with feedstocks incorporating reclaimed Bright and Burley stemmery dust from Engineering studies. Subjective screening of handmade cigarettes showed two formulations to be close in attributes to the RCBT control. Semi–Works Marlboro cigarettes were made and are currently being evaluated on internal panels.

2. **Plans:** Complete subjective evaluations and make subjective based recommendations.

3. **Contributors:** B. Hoskin, M. Parker, L. Vinson, J. Swain, L. Jennings, E. Patterson, ARD, CTSD and Semi–Works.

XII. Objective: To support cooked flavor production, qualification of alternate vendors and automation/scale–up of the reactor at the Flavor Center.

A. **Strategy:** Implement and establish specifications for alternate vendor ingredients in cooked flavor and develop procedures to establish baseline analyses to support automation/scale–up of reactor at the Flavor Center in 1994.

1. **Results:** Implementation of alternate vendor ingredients in 75–814 was monitored at the Flavor Center. Subjective and analytical evaluations were made of initial batches. After adjustments in formulation to yield target quantities per batch, subjective and analytical approval were recommended.

Various analytical procedures are being developed and evaluated to establish baseline data on 74–814 in anticipation of automation/scale–up of the reactor at the Flavor Center. Modifications have been delayed until 1994 due to budget.

Laboratory batches of stem casing 90–659 were made with alternate vendor sugar which showed no subjective differences compared to the control. Flavor transmittal was written for 90–659 recommending the substitution.

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2. **Plans:** Continue to support production of 75–814 and monitor implementation of 90–659 formulation.

3. **Contributors:** B. Hoskin, J. Swain, A. Warfield, W. Thomas, S. Johnson, B. Monahan, ARD, CTSD and Semi–Works.

XIII. Objective: Conduct subjective and feasibility studies of burley stem usage through ES and IS processes to reduce cost of discount products.

A. Strategy: Substitute Burley for Bright stems in both ES and IS at a blend rate which can be subjectively modified to replace current IS in discount products. Due to common infeed for ES and IS, strategy was to blend these final products to utilize both processes of the modified stem feedstock.

1. **Results:** From initial subjective screening of 50/50 blend of ES and IS from Louisville production with 30% Burley stem inclusion, blends of uncased IS with standard and modified cased ES were selected by the Leaf Blending group to evaluate in BRICA blends. Preliminary subjective screening of the test IS/ES blends in Semi–Works BRICA configuration cigarettes showed the IS and standard cased ES to be closer to the control IS. Panel evaluations are in progress to select IS/ES test blend for large–scale production trials.

2. **Plans:** Recommend IS/ES blends for further trials to confirm subjective results and resolve processing effects on physicals.

3. **Contributors:** B. Hoskin, J. Swain, L. Jennings, ES/IS, Semi–Works, ARD, CTSD.

NET INCLUSION

XIV. Objective: Replace DIET with NET in all Premium Brands (except Marlboro FF and Lights) and increase the inclusion rate by 3%.

A. Strategy: Evaluate the substitution of NET for DIET processed tobacco at current and increased levels.

1. **Results:** Replicate POL tests of B&H Full Flavor 100's SP (POL 05059 and 05069) and Merit KS (POL 02092 and 02126), both with 15% NET inclusion, were completed. Results of all tests indicated no significant differences between either test product and its respective control region.

   POL 02127, Merit Ultra Lights KS with 25% NET, that was produced and shipped during the first quarter, is complete. Results of this test indicated that there was no significant difference between the test product and its control region. B&H Menthol 100's Full Flavor with 15% NET, POL 06041, originally scheduled for shipment in March, was rescheduled and shipped the week of May 18, 1993. Results of this POL are expected in early June.

   Internal subjective evaluations of Marlboro Ultra Lights KS, Virginia Slims Full Flavor and Lights (non–menthol) and Parliament current products vs. NET (3%

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inclusion increase), are complete. Results of these evaluations indicated that the NET versions were subjectively comparable to their respective controls. Prototypes for internal subjective evaluations have been produced for the following brands: Virginia Slims Ultra Lights, B&H Deluxe Ultra Lights and Lark KS current products vs. NET (3% inclusion increase). Analyses and subjective evaluations are in progress.

Parliament 100 prototypes were produced at Stockton Street for a Danchi Panel consumer test to evaluate NET at a 15% inclusion rate replacing BLDET at 13%. Results from this test will be available in early July, 1993. A second Danchi test to evaluate the same product is planned for production in early June at Stockton Street for shipment to Japan in July, 1993.

2. **Plans:** Complete analyses and internal subjective evaluations of recently produced prototypes. Review all POL test results and schedule, if necessary, POL tests for the 3rd – 4th Quarter, 1993 to evaluate any additional brands with NET. Produce prototypes for second Danchi Panel Test. Produce Saratoga prototypes at Stockton Street with NET for internal subjective evaluations.

3. **Contributors:** B. Taylor, B. Peace, C. Moogalian, J. Atkinson.

MULTIFILTER CUT FILLER CONSOLIDATION

XV. Objective: Eliminate the unique aftercut applied to Multifilter; evaluate changing to the Merit aftercut system.

A. Strategy: Produce prototypes with the Merit aftercut system for internal subjective evaluations.

1. **Results:** Multifilter prototypes were produced in Semi–Works for the evaluation of the Merit aftercut system. Analyses and subjective evaluations are in progress.

2. **Plans:** Complete subjective and analytical evaluations and make a recommendation in the third quarter.

3. **Contributors:** B. Taylor, T. Gannon.

WOOD PULP PAPER UTILIZATION

XVI. Objective: Incorporate Wood Pulp paper on all PM Premium Brands with no change in subjective attributes.

A. Strategy: Produce and evaluate, both subjectively and analytically, Marlboro prototypes incorporating Wood Pulp papers.

1. **Results:** Prototypes were produced with 100% Flax (control), 85% Flax/15% Wood, 75% Flax/25% Wood and 62% Flax/38% Wood Pulp papers. The 75% Flax/25% Wood Pulp paper prototype was found to have different subjective attributes when compared to the control. Due to variation in cigarette paper porosity on some of the samples, this series of prototypes was remade with selected

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bobbins of paper. Analyses and subjective evaluations are in progress for this latest series of prototypes.

2. **Plans:** Complete subjective evaluations. POL test candidates during the third quarter, if warranted.

3. **Contributors:** W. Geiszler, M. White, H. Maxwell, Paper Technology Group.

MENTHOL APPLICATION STRATEGIES

XVII. Objective: Evaluate alternative methods of menthol application for the Menthol–on–Foil process.

A. Strategy: Evaluate the potential for replacing Menthol–on–Foil (MOF) with Spray Mentholation.

1. **Results:** A scenario has been developed describing the impact to Primary Operations, Cigarette Fabrication and the finished product if MOF is replaced with Spray Mentholation. Currently, the majority of MOF products use either the MB4b or Alpine cut filler. If MOF was eliminated in favor of spray mentholation, this would increase to two (2) different Alpine cut fillers and two (2) different MB4b cut fillers (with the difference being menthol level in the aftercut). Current estimates also indicate that five (5) different plasticizer menthol levels would be needed as compared to the current two (2). If this conversion was pursued, it is estimated that there would also be a reduction in alcohol usage of approximately 5.47 gallons per line processed. Additionally, it should be noted that Virginia Slims Super Slims would still require both filler and MOF due to its high menthol loading.

2. **Plans:** If this scenario is feasible, produce prototypes in Semi–Works to assure targeted menthol deliveries are met during the third quarter.

B. Strategy: Evaluate the new Kaymich FDU–3 Flavor Applicator as an alternate method for applying menthol.

1. **Results:** A scenario was developed describing the impact to Primary Operations, Cigarette Fabrication and the finished product if all menthol application is converted to a Kaymich Applicator at Louisville. Currently, Louisville has 13.5 silos designated for menthol production. If a Kaymich FDU–3 Applicator was approved, estimates indicate that a minimum of eight (8) Kaymich units would be necessary resulting in a savings of 11.5 silos. Additionally, there would be a reduction in the number of aftercuts required and the amount of alcohol consumed in the menthol aftercuts.

2. **Plans:** Discuss with Kaymich the options available to acquire a unit for evaluations.

3. **Contributors:** H. Maxwell, W. Thomas, G. Yatrakis.

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FLAVOR REVISIONS

XVIII. Objective: Reduce ingredients from PM Direct Materials to meet PM standards and comply with worldwide legal requirements, reduce and simplify ingredient sources and assist the Flavor Center with evaluations of quality and flavor issues.

A. **Strategy:** Subjectively evaluate revisions and first shipment samples from vendors where ingredients have been removed and determine acceptability.

1. **Results:** No activity was requested during this reporting period.

2. **Plans:** Presently, there are no outstanding revision requests.

3. **Contributors:** T. Cravotta, S. Skalak, D. Williams, C. Comes, P. Andrews.

B. **Strategy:** Identify alternate vendor flavors for current direct materials and evaluate submissions for approval.

1. **Results:** Two alternate vendor products were subjectively evaluated. One product was approved, the other was rejected. An additional vendor is being sought for the rejected product.

2. **Plans:** Alternate vendor samples will be subjectively evaluated as needed.

3. **Contributors:** T. Cravotta, S. Skalak, C. Comes, P. Andrews.

C. **Strategy:** Reduce flavor and flavor components to meet PM standards, comply with worldwide legal requirements and reduce the number of sole source ingredients.

1. **Results:** Twenty–one Direct Material flavors from one supplier that were duplicated last year are scheduled to be removed from the system during 1993. Implementation of the revised formulas are occurring based on inventory depletion of the original flavors.

   A revised Merit flavor concentrate for use in Europe, previously tested and approved domestically on Merit, is currently being evaluated in Europe.

   Evaluations of twelve (12) flavors from one supplier are being evaluated for removal from the PM Direct Materials list. Six (6) of the flavors have been reformulated, evaluated and completed. The remaining six (6) flavors are under subjective evaluation.

   Four vendor flavors currently purchased direct by Belgium were evaluated internally for duplication. Two of the flavors were successfully duplicated using DM coded ingredients exclusively. The other two flavors could not be duplicated with current DM coded items.

2. **Plans:** Pending completion of the European test, revise the Merit flavor concentrate. Evaluations and transmittals will occur as requested by Regulatory and Technical Services.

3. **Contributors:** T. Cravotta, S. Skalak, J. Pflueger, M. B. Lambert, D. Williams.

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D. **Strategy:** Assist the Flavor Center with subjective evaluations on flavor quality related issues.

1. **Results:** Five (5) Direct Material coded products were subjectively evaluated against control samples and approved.

2. **Plans:** Continue to support the Flavor Center with subjective evaluations on flavor quality related issues.

3. **Contributors:** T. Cravotta, S. Skalak, J. Pflueger, H. Maxwell, P. Andrews.

ALL LAMINA BLEND

XIX. **Objective:** Develop a Full Flavor KS product using an all lamina blend (no reconstituted or stem products).

A. **Strategy:** Design and develop prototypes.

1. **Results:** POL 03116 was completed this quarter. Additional prototypes were produced in Semi–Works to evaluate an increase in the burley spray application rate to lower the perceived strength.

2. **Plans:** Program definition is in progress to determine a new direction for this project.

3. **Contributors:** H. Maxwell, L. Vinson, R. Keatts.

DISTINCTIVE FLAVORS EXPLORATORY PROGRAM

XX. **Objective:** Determine the consumer interest in the concept of "distinctively flavored" cigarettes. If the concept is viable, develop a family of flavors that deliver a characteristic and distinct flavor sensation.

A. **Strategy:** Conduct quantitative product testing to gauge consumer appeal, narrow/determine the field of potential flavors and to start building knowledge of smoking behavior related to "New Flavors" in April, 1993.

1. **Results:** Aging studies were completed on thirteen (13) originally developed distinctive flavors to determine their subjective stability over time. Additionally, new flavors were developed to deliver the flavor character of liquers and cordials. A total of eighteen (18) flavors have now been developed for this program. Filler was oversprayed in Semi–Works small scale for evaluation of the eighteen flavors. However, due to concerns over contamination on the make–pack floor, prototype production was cancelled. If necessary, prototypes for quantitative testing will be produced in the laboratory.

2. **Plans:** Provide New York Marketing Research with sixteen (16) different distinctively flavored products (300 cigarettes each) to conduct their quantitative research when requested.

3. **Contributors:** T. Cravotta, A. Goldfarb, J. Jones, A. Lopez, J. Spruill, G. Yatrakis.

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FACTORY SUPPORT

XXI. Objective: To provide support for the subjective qualification of factory primary modernization programs.

A. Strategy: Qualify new P&S dryers at the Manufacturing Center.

1. **Results:** All new P&S dryers have been qualified for use at both single and double rates.

2. **Plans:** Provide support as needed to optimize dryer performance.

3. **Contributors:** W. Bell, R. Bowman, R. Rainey, S. Rudis, J. Sherron and D. Spruill.

B. Strategy: Qualify expansion process stem reclamation from the VT separator.

1. **Results:** R&D testing of reclaimed stems added back to DIET at various rates and moistures indicated subjective differences. Additional testing has been initiated incorporating reclaimed stems in BLDET.

2. **Plans:** Complete subjective evaluations by June, 1993.

3. **Contributors:** P. Aument, W. Bell, J. Sherron, D. Spruill and C. Wood.

C. Strategy: Qualify new aftercut cylinders at the Manufacturing Center.

1. **Results:** Cylinder No.'s 5 – 8 have been subjectively qualified for production.

2. **Plans:** Cylinder No.'s 1 – 4 are scheduled for installation and subjective qualification during the third quarter, 1993.

3. **Contributors:** W. Bell, R. Bowman, J. R. Craig, S. Rudis, J. Sherron and D. Spruill.

XXII. Objective: To achieve subjective parity between small and large–scale operations so that sample size will be the only factor for determining whether primary samples are produced in small or large scale in the Semi–Works.

A. Strategy: Qualify the small scale ET/ES add–back and flavor overspray operation utilizing filler processed in large scale.

1. **Results:** This portion of the small scale operation has been qualified for use in the Semi–Works. The qualification was based on evaluations of chemical, physical and subjective data as compared to Marlboro Standardization specifications. This operation will satisfy a majority of the work that Flavor Technology needs for prototype development.

2. **Plans:** The next objective for the Small Scale Improvement Team is to qualify the small scale filler drying operation.

3. **Contributors:** W. Bell, E. Craze, K. Dudzinski, T. Gannon, S. Skalak, T. Skidmore, V. Smith, M. Tallman, M. White and V. Willis.

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XXIII. Objective: To establish standards and operating conditions for the overtipping process in order to minimize variability and ensure the subjective and physical quality of overtipped cigarettes.

A. Strategy: Identify potential problem areas associated with the overtipping operation in the Semi–Works.

1. **Results:** Potential problem areas have been identified by the team and action was taken to resolve them.
2. **Plans:** All activities outlined in the team's charter should be completed by the third quarter, 1993.
3. **Contributors:** R. Bain, G. Inge, C. Scott, M. Smith, D. Spruill, R. Tredway and L. Wettle.

LICORICE REPLACEMENT

XXIV. Objective: Investigate potential licorice substitutes and consolidate generic products casing systems.

A. Strategy: Remove licorice in current Burley Spray.

1. **Results:** POL's 03078 and 03085 with licorice removal (100 and 50%, respectively) have been completed.
2. **Plans:** Additional POL's will be made with 50 and 100% licorice removal during the third quarter, 1993 using the current Marlboro blend.
3. **Contributors:** W. Bell, J. Sherron, D. Spruill, M. White, B. Woodson, ARD, CTSD, PED and Semi–Works.

B. Strategy: Evaluate the replacement of sucrose with isosweet in the Brica Burley Spray system.

1. **Results:** Initial internal testing showed subjective differences.
2. **Plans:** Testing will be repeated during the third quarter, 1993.
3. **Contributors:** W. Bell, J. Sherron, D. Spruill, M. White, ARD, CTSD and Semi–Works.

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PROGRAM NAME	:	International Product Development – Export – Marketplace Driven
PROGRAM COORD.	:	J. N. Smith
WRITTEN BY	:	J. Easley, J. Hickle, R. Lambert, D. Sealey, and B. Tierney
PERIOD COVERED	:	Second Quarter, 1993

I. Objective: Support the growth of international business through the launch of new commercial products for U.S. export to markets in Asia, EEMA, EEC, and LA/I, and through support of J.T. licensee production.

A. Strategy: Tar Delivery Reduction – In response to a decrease in sales weighted tar averages in both the Japanese and Korean markets, several brands are slated for tar reductions.

1. Results:

PMSL 100's FTB – JAPAN Interim specifications were issued in January, 1993 to reduce tar from 8.0mg to 7.0mg in order to deplete existing inventories of purchased filter and tipping paper.

MARLBORO – Japan

Marlboro Lights KS cigarettes at 9mg TIOJ tar (DIET inclusion blend) were produced in J.T.'s Kanazawa factory for Danchi testing. Testing has been completed and results analyzed. This product met the objective of achieving parity in liking and strength ratings with Mild Seven Lights among Mild Seven Lights smokers. Analytical results using the new TIOJ method indicate that the printed pack tar/nicotine numbers for Marlboro KS can be changed from 15mg/1.1mg TIOJ to 13mg/1.0mg TIOJ without changing the product.

VIRGINIA SLIMS LIGHTS – JAPAN PMKK has requested a tar reduction for the Virginia Slims Lights family from 9mg TIOJ to 6mg TIOJ to take place in conjunction with the packaging graphics change. U.S. Virginia Slims Ultra Lights Menthol cigarettes are being analyzed by TIOJ methods to determine if this product's specifications will be appropriate to use for the Japanese Virginia Slims Lights Menthol. Filter and blend alternatives are being reviewed to achieve the tar reduction for Virginia Slims Lights Charcoal product.

MARLBORO – KOREA The manufacture of initial orders of Marlboro KS (SP and FTB) at reduced tar levels of 10.0mg FTC have been completed and shipped. Marketplace availability is planned for mid–May, 1993.

Consumer testing of Marlboro at 10.0mg and 8.0mg by FTC smoking methodology has been initiated. Additional prototypes with carbon on tow filters at 10.0mg and 8.0mg was incorporated into SCP test E–8437. This test was shipped May 14, 1993. Fieldwork results are expected early July, 1993.

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2. **Plans:**

PMSL 100's FTB – JAPAN Brand changed to new graphics tipping in March, 1993. Increased pressure drop filters have been ordered from FIL, Ltd. for arrival early June, 1993. At this time, new specifications will be issued for a reduction of tar from 7.0mg to 6.0mg. Previously purchased filters will be used up with a minimum of obsolescence.

MARLBORO – JAPAN Marlboro Lights Japan tar/nicotine reduction 11mg/0.9mg TIOJ to 9mg/0.7mg TIOJ will be implemented by September 1, 1993. The printed pack numbers for Marlboro KS and Marlboro 100 will change from 15mg/1.1mg TIOJ to 13mg/1.0mg TIOJ by September 1, 1993. Marlboro 100 models will be produced in Kanazawa the week of June 7, 1993 to determine whether any specification adjustments will be required to achieve a delivery of 13mg TIOJ tar.

VIRGINIA SLIMS LIGHTS – JAPAN Virginia Slims Lights Charcoal and Menthol tar reductions from 9mg TIOJ to 6mg TIOJ are scheduled for implementation in July, 1993.

MARLBORO – KOREA SCP Panel II testing will begin early June to evaluate Marlboro at 10.0mg and 8.0mg FTC tar levels. This research will focus on the consumer acceptance of carbon filter systems at these tar levels.

Additional testing of Marlboro Lights at 6.0mg FTC will also be initiated with the utilization of carbon on tow filter systems. Shipment of this test is expected mid–June, 1993.

3. **Conclusions:**

MARLBORO – KOREA Evaluate consumer research data and determine if Marlboro in Korea should incorporate carbon filter systems to help foster the growth of the brand in Korea.

4. **Contributors:** Easley, Hickle, Sealey, Brumberg, Chambers, Matthews, Parrish, Shelton, Utz, PMKK

II. Objective: Support growth of international business, short term, through the launch of new commercial products and through support of affiliate and licensees.

A. **Strategy:** Support of Marlboro licensee production by JT, including monitoring of production transfer from Odawara to Kanazawa.

1. **Results:**

JAPAN MARLBORO FACTORY LOCATION CHANGE The production transfer of the Marlboro brand family from JT's Odawara factory to the Kanazawa factory has been completed. Marlboro KS and Marlboro Lights KS cigarettes, produced at Kanazawa, were evaluated in two Danchi panel tests. Results indicate that differences exist between the Odawara and Kanazawa products. Investigations have been initiated to identify differences between the factories regarding operating procedures, materials, etc. Future action will be based on the

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